Effective Health Care

Normal Saline Instillation with Suctioning of Endotracheal Tubes and Tracheostomies

Next Steps

The nominator is interested in using a new systematic review to inform clinical practice at their organization about the use of normal saline during suctioning of endotracheal tubes and tracheostomy.

Due to limited program resources AHRQ will not further assess this topic at this time. We identified three systematic reviews which may be useful for the nominator. No further activity on this topic will be undertaken by the Effective Health Care (EHC) Program.

Topic Summary and Considerations

Topic Name and Number: Normal Saline Instillation with Suctioning of Endotracheal Tubes and Tracheostomies, #697

Date: 7/31/17

Key question from the nomination:
What are the benefits and harms of normal saline instillation when suctioning endotracheal tubes and tracheostomies in adults?

- Tracheal intubation involves the placement of a flexible tube, most commonly an endotracheal tube, into the trachea to provide respiratory support for various reasons such as difficulty breathing on one's own, or for protection of their airway. A tracheostomy is a surgically created airway with placement of an artificial airway in the trachea, typically for those who have had difficulty weaning off a ventilator.
- Suctioning of the endotracheal tube or tracheostomy is commonly done to remove secretions and keep the airway clear of obstruction, and prevent hypoxia. These secretions may be viscous and difficult to remove, and it is theorized that the use of normal saline (NS) could help loosen secretions and facilitate their removal. However there are concerns about adverse effects including patient discomfort, increased heart rate, cardiac dysrhythmias, decreased of oxygenation, and changes in blood pressure [1, 2].
- The use of NS with endotracheal suctioning is not endorsed by the American Academy of Respiratory Therapists [3]. This is cited as an evidence gap in an AAO-HNSF consensus statement on tracheostomy care [4]. A previous review had noted that studies on this are small and firm conclusions could not be made [5].
- The use of normal saline with suctioning is widespread. A survey of nurses and respiratory therapists in 2015 [2] found that all nurses and 89.5% of respiratory therapists used NS with endotracheal suctioning at least some of the time. An updated review of the evidence could inform practice and clinical guidance.
- While we are unable to further assess this topic at this time, these references may be useful to the nominator
    - Ayhan et al (2015) [6]. This review focused on endotracheal tube suctioning. It found that in two studies, the volume of secretions removed was greater when using NS, though the results were not statistically significant in one of the studies. Most of the five studies determined that oxygen saturation decreased significantly after endotracheal suctioning with saline when compared to the

baseline values obtained before suctioning. Effect on hemodynamics was inconsistent across studies.

- Caparros et al (2014) [7]. This literature review of studies for both endotracheal tubes and tracheostomies concluded that normal saline instillation could be associated with complications such ventilator-associated pneumonia and hemodynamic changes.
- Wang et al (2016) [8]. This systematic review included studies of patients with endotracheal tubes and tracheostomies. 5 studies concluded that normal saline instillation significantly decreased SaO2 after 5 minutes after suctioning. They could not make a conclusion about heart rate changes. They noted that the studies were small, and recommended larger scale studies.

References

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